

BLACKWOOD (W.R.D.)

A YEAR'S WORK IN

# ELECTRO-THERAPEUTICS

CONCERNING THE MERITS

OF DIFFERENTLY MADE APPARATUS.

—BY—

W. R. D. BLACKWOOD, M. D.

COMPLIMENTS OF  
THE CHLORIDE OF SILVER DRY CELL  
BATTERY CO.  
OF BALTIMORE, MD.





A YEAR'S WORK IN  
ELECTRO-THERAPEUTICS

CONCERNING THE MERITS  
OF DIFFERENTLY MADE APPARATUS.

—BY—

W. R. D. BLACKWOOD, M. D.



PRESS OF  
PHISTER PRINTING CO.  
BALTIMORE.

[Extract from THE MEDICAL SUMMARY, PHILADELPHIA. April, 1894.]

## A Year's Work in Electro-Therapeutics concerning the merits of differently made Apparatus.

---

WHEN I was a boy (no reference to Pinafore, although I have sung in that delightful little opera more than once,) I well remember the delight when a good natured engine driver let me run the locomotive for a mile or two, never thinking that after awhile I would survey as an engineer more than ten times the distance on the same road, and that, "after the war was over" I would run hundreds of miles on en-

gines three times as fast as those of my boyhood's days of magnificent exaltations. What has this to do with Electro-Therapeutics? Well it has, and for this reason. Many a time one of my friends who wrote, (for he is dead) used to decry such adjustments in machinery of an electrical nature, which he did not value, as being "rows of shining buttons and contraptions," saying: the blessed thing wouldn't work." Now, in replying to him, in an article where he had sat down on me about such attachments, I used the illustration of the locomotive of the past and the present thusly: Forty years ago, the "iron horse" had a throttle, a reversing lever, a pump, and a scanty set of trial gauges; the driver had to work like a horse to start, stop, or guide the machine; nowadays, how about it? Well, it has "rows of shining

contraptions," and by their aid the driver sits comfortably in his cab, and the touch of a baby's finger is amply sufficient to operate any or all of the adjuncts which control the awful force which carries at a hundred miles an hour the thousands tons of humanity across the continent. My first batteries were clumsy, and with few attachments of any nature ; now I have on all my machinery many attachments for the easy operation of the current, all of which are useful, desirable, and indispensable to the expert who thus gets from the force what the neophyte or routine bungler knows nothing about. As with the adjuncts, so was it with the cell itself, then as now. We had the Grove, the Bunsen, the Callaud, the Smee ; these gave way gradually to the Lelanche, with men who admired cleanliness and cheapness of main-

tainence ; but manufacturers kept up the cry of "no power" about these advances, and urged the so-called "electropoin fluid" cells of zinc-carbon, which are powerful without any doubt, both for electromotive force and destructive qualities to everything they come in contact with, including themselves. Ten years ago the abandoned chloride of silver cell of Gaiffe and others on the European continent were taken up with a view to see what could be done with them in the way of improvement by the distinguished electrical engineer, Mr. John A. Barrett, of New York, and he got them after a while, into very good shape, indeed, so far as cleanliness and usefulness went, for the doctors. By and by the fracture of them went into the hands of a company in Baltimore, which spent many thousands of dollars on them in



seeking to avoid the high internal resistance of such elements, and to make them actual dry cells, with all the value that such construction implies. In the hunt for good articles in my work, I got hold of these cells, and it simplified my trials and annoyances remarkably when I put them in place of the dirty electropoin affairs, and removed the difficulty of waiting, when busy, for the Lelanches to restore their activity when polarized by prolonged use. Writing so much as I do about Electro-Therapeutics, I naturally endorse them frequently, and thereby got some of the makers of other brands down on my ideas, and they have kicked vigorously and often. But I am after just the same thing that all of us are looking for in business, viz.: the best article for designed work, at the lowest cost of original purchase and re-

pair ; the most easily handled mechanism as to stability and utility, in short, economy in instruments, all things considered. This I got in the chloride of silver batteries of both kinds, faradic and galvanic.

As the best proof of cost in anything is a carefully kept debit and credit account, I have entered item by item what was required for all my outfit every day for many years past, and I now propose to show how the account stands for the work done. Imprimis : I have averaged almost exactly three hours daily work in Electro-Therapeutics for five years past, and a strict account has been kept of the time expended on each patient ; the kind of current used ; the strength of current in amperes and volts ; (except in static applications,) the cost at starting of the machinery ; its cost of support for repairs and supplies de-

manded : in fine, the number of coulombs expended at so much per coulomb. Now, I don't want to take up much space in details technically expressed, nor to waste the time of my readers in lines not really required in this thing, so I will simply give the items which are of direct interest. Six years ago I used two galvanic batteries of the electropoion type, whose original cost was sixty-eight dollars. In one year I did eight hundred hours' work with them ; I made repairs to them myself worth, if done at the factory, sixteen dollars : I paid the maker eleven dollars for work demanded, which I had not time to do, or ability to do properly from lack of materials, such as walnut cases and new work of other kind : I bought twelve dollars and sixty-seven cents worth of sulphuric acid and bichromate of potassa, to make fluid

with, not counting the worth of the water or the repairs to the kitchen sink, when it was injured by the slopping of the destructive electro-poin fluid. The total cost of maintainence was, therefore, thirty-nine dollars and sixty-seven cents; the value of the batteries at the end of the year was about one-fourth of their original cost, viz.: seventeen dollars. Although I am a fairly good mechanic, and very careful in handling all apparatus, I spoilt at least twenty dollars worth of carpets and rugs in my office, to say nothing about having to repaint and re-varnish the floor because of the leakage or spilling the destructive fluid. Generally the patients did this by running against the machinery. This is one side. Now for the other.

In the Year of Our Lord, 1893, I did twelve hundred and eighty-four hours' work with the two chloride of silver galvanic batteries, (one a thirty-two cell, and the other a fifty cell combined galvanic and faradic,) whose original cost was one hundred and ten dollars: they are now both improved and much cheaper. With the faradic part of the combined battery I have done seventy hours' work only, as I employ a larger and more complete machine for that particular current—the number eight. The galvanic batteries are apparently new to look at, as they are kept in pasteboard boxes, away from dust, and carefully wiped free from finger stains before putting them away: they look new inside, for the metal parts are kept clean and bright without more trouble than wiping them with a cotton cloth kept in each box, and, as

it matters not whether they stand upright, upside down, or on end all the time, leaking or splashing cannot occur at all. There has been no new cells bought for either of them, nor for the faradic part of the combined battery, and they will doubtless work for about two hundred hours more before requiring new cells, and when the new cells are put in at a cost of thirty cents each, they will be practically as good as they were the 1st of January, 1894. So much for that. The number eight faradic cost thirty-five dollars originally, with it I have done seven hundred hours' work, and in that time I have used up three cells, one large, and two small, costing three dollars. Two days ago I took out three large cells to admit new ones, which will cost four dollars and fifty cents. I use very heavy currents in faradism purposely always.

and as I had a case where it was employed in destroying the embryo, in an extra uterine fixation, great expenditure of cell action was unavoidable. I mention this because some folks might think it queer that in galvanism I got twelve hundred and eighty four hours work with only seven hundred and seventy hours out of faradic apparatus in fourteen months : *but*, in the constant current applications I had at my disposal, eighty two cells under rheostatic control, whereas with the faradic work I used nearly the full power of the three cells all the time, actually giving them fifty times as much to drive through the tissues as their quiet galvanic friends had to do. The cost of all the six cells was recovered in two or three applications to patients. The meter and the current controller (Willms) used with the galvanic apparatus cost

forty five dollars, and it will last to the end of my time, and for fifty years more in good hands. They cost nothing to keep or repair.

With the electropoin fluid cells I could not use any meter, for the current wobbled so much and dropped so fast in a few minutes' work, as to make its use worthless : it was so much current at starting : much less in five minutes : and nothing at all in about an hour. With the chloride cells it is, so much to begin with, the same in five minutes, or five hours, or five weeks : the index stays at the same point till the whole battery is worn out, and then you put in new cells for little and begin over again. My static machine has cost nothing at all for five



years' wear ; one glass plate is cracked from the top to the centre, but as it is a stationary one it may go on for five years more. Now, my object in writing this paper has been very much to answer many queries as how costly batteries are in actual work. I get letters every week at least, asking such questions ; maybe this will be more satisfactory to many, than the replies privately sent to them, and it may reach some who want to ask but are modest, and diffident, as so many good doctors are. Outside of my telephones, signals, etc., I use nothing now except chloride of silver dry cell apparatus from the Baltimore company, and I won't change till some much better arrangement is dis-

covered, but how that is to arise is more than I can tell. I have been working at the alternating system for a while towards ridding the outfit of the annoyance of static machines, in summer or wet days, but it is a hard nut to crack.

W. R. D. BLACKWOOD, M. D.

246 N. 20th Street, Philadelphia, Pa.



